Claims:

1. A power generator for an underwater vessel that transits through an underwater thermocline having a temperature range, said power generator comprising:

at least a portion of a shell of an underwater vessel made from a thermally conductive material, said portion having an outer surface in contact with a surrounding underwater environment and an inner surface opposing said outer surface and not in contact with said surrounding underwater environment;

a plurality of thermo-to-electric energy converters electrically coupled together, each of said plurality of thermo-to-electric energy converters having a first surface and a second surface with said first surface being thermally coupled to said inner surface of said portion of said shell; and

a phase change material thermally coupled to each said second surface of said plurality of thermo-to-electric energy converters, said phase change material having a phase change temperature that is approximately equal to an average of upper and lower temperature extremes of said temperature range of said underwater thermocline, wherein said plurality of thermo-to-electric energy converters generate electrical power as the underwater vessel transits through said

underwater thermocline.

2. A power generator as in claim 1 wherein each of said plurality of thermo-to-electric energy converters is selected from the group consisting of bismuth telluride and bismuth telluride-antimony telluride.

3. A power generator as in claim 1 wherein said phase change material is a paraffin wax.

4. A power generator as in claim 3 wherein each of said plurality of thermo-to-electric energy converters is selected from the group consisting of bismuth telluride and bismuth telluride-antimony telluride.

5. A power generator as in claim 1 further comprising a material structure having tubular passages formed therein and filled with said phase change material, said material structure positioned adjacent said plurality of thermo-to-electric energy converters.

6. A power generator as in claim 5 wherein said phase change material is a paraffin wax.

7. A power generator as in claim 6 wherein each of said plurality of thermo-to-electric energy converters is selected from the group consisting of bismuth telluride and bismuth telluride-antimony telluride.

8. A power generator as in claim 1 wherein said plurality of thermo-to-electric energy converters are electrically coupled together in series.

9. A power generator as in claim 1 wherein said plurality of thermo-to-electric energy converters are electrically coupled together in parallel.

10. A power generator for an underwater vessel that repeatedly transits through an underwater thermocline having a temperature range, said power generator comprising:

at least a portion of a shell of an underwater vessel made from a thermally conductive material, said portion having an outer surface in contact with a surrounding underwater environment and an inner surface opposing said outer surface and not in contact with said surrounding underwater environment;

a plurality of thermo-to-electric energy converters electrically coupled together, each of said plurality of thermo-to-electric energy converters having a first surface and a second surface with said first surface being thermally coupled to said inner surface of said portion of said shell; and

a thermal buffer thermally coupled to each said second surface of said plurality of thermo-to-electric energy converters for maintaining each said second surface at a temperature that is approximately constant as the underwater vessel repeatedly transits through said underwater thermocline, wherein said plurality of thermo-to-electric energy converters generate electrical power.

11. A power generator as in claim 10 wherein each of said plurality of thermo-to-electric energy converters is selected from the group consisting of bismuth telluride and bismuth telluride-antimony telluride.

12. A power generator as in claim 10 wherein said phase change material is a paraffin wax.

13. A power generator as in claim 10 wherein said plurality of thermo-to-electric energy converters are electrically coupled together in series.

14. A power generator as in claim 10 wherein said plurality of thermo-to-electric energy converters are electrically coupled together in parallel.

15. A method of power generation comprising the steps of:

providing an underwater vessel having at least a portion of a shell thereof made from a thermally conductive material, said portion having an outer surface in contact with a surrounding underwater environment and an inner surface opposing said outer surface and not in contact with said surrounding underwater environment;

providing a plurality of thermo-to-electric energy converters electrically coupled together, each of said plurality of thermo-to-electric energy converters having a first surface and a second surface;

positioning said plurality of thermo-to-electric energy converters such that each said first surface is thermally coupled to said inner surface of said portion of said shell;

thermally coupling a phase change material to each said second surface of said plurality of thermo-to-electric energy converters, said phase change material having a phase change temperature that is approximately equal to an average of upper and lower temperature extremes of said temperature range of said underwater thermocline; and

transiting the underwater vessel through said underwater thermocline, wherein said plurality of thermo-to-electric energy converters generate electrical power.

16. A method according to claim 15 further comprising the step of continuously repeating said step of transiting.

17. A method according to claim 15 wherein each of said plurality of thermo-to-electric energy converters is selected from the group consisting of bismuth telluride and bismuth telluride-antimony telluride.

18. A power generator as in claim 15 wherein said phase change material is a paraffin wax.

19. A method according to claim 15 further comprising the steps of:

providing a material structure having tubular passages formed therein and filled with said phase change material; and positioning said material structure adjacent said plurality of thermo-to-electric energy converters.

20. A method according to claim 19 wherein said phase change material is a paraffin wax.

21. A method according to claim 20 wherein each of said plurality of thermo-to-electric energy converters is selected from the group consisting of bismuth telluride and bismuth

telluride-antimony telluride.